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Lundgren, Jens

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Editorial

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In this issue of the journal, Awad et al. (2018) report concerning a high (10%) annual HIV transmission risk between sexual serodiscordant couples across 23 sub-Saharan African countries, and further report a strong correlation of this risk with the HIV prevalence within each of the countries.

HIV remains a major global public health threat, with around 2 million new infections per year (UNAIDS DATA, 2017). Although antiretroviral therapy (ART) has scaled up and is now accessed by more than 18 million persons globally, there remain at least 20 million person still untreated. ART not only reduces risk of morbidity and mortality from HIV (Danel et al., 2015; Lundgren et al., 2015), but if fully effective will also substantially reduce risk of onward transmission by any route including sexual, mother-to-child, or persons sharing needles (Cohen et al., 2016; Rodger et al., 2016). The HIV epicentre was in Africa, and it is also on this continent that the largest number of infected persons lives.

The key determinant of risk of sexual transmission of HIV is the amount of virus replicating in the already-infected person. The viral replication rate is influenced by viral factors (some replicate more rapidly than others), by host genomic factors (in particular the HLA type), and by ART. Importantly, it is now well established for heterosexual couples that as long as the index person is receiving ART, and as long as the ART is fully effective in controlling replication, the risk of transmission – even condom-less – is close to zero (Rodger et al., 2016). This strong preventive effect of ART is seen also in populations where other sexually transmitted diseases occurs relatively frequently (Cohen et al., 2016). Recent data also suggest that this protective effect can be extended to condomless anal sex, which otherwise would carry an approximately 3-fold higher risk of transmission compared with vaginal sex (Cohen et al., 2016; Rodger et al., 2016).

The mode by Awad et al. (2018) supposedly takes ART coverage in the population (i.e. % of infected persons on ART) into account, and assumes that the protective effect from ART is 96%. This number is reasonable derived from a large randomised controlled trial (HPTN 052 (Cohen et al., 2016)). However, the key determinant of the effect from ART is the extent that the therapy is able to fully control viral replication or not. In HPTN 052 (Cohen et al., 2016), a total of 8 linked transmissions were observed after the index person had started ART, but all were linked to situations where replication was either not yet fully controlled or had rebounded because of variable adherence. Future work should therefore incorporate ART coverage and rate of full suppression among those on ART as two key parameters in addition to HIV prevalence. When done, it is projected that these parameters will equally strongly correlate with risk of sexual transmission. In sexual relationships where the already-infected person is on fully suppressive ART, the risk will be expected to be close to nil.

Given that we do not have an effective HIV vaccine, control of the future evolution is based on behavioural and medical preventive strategies. Of these, the medical strategies are being focused on, as modification of sexual behaviour is most often ineffective.

So how do we further improve medical preventive strategies? Use of ART to prevent transmission of course requires that the person is diagnosed, and many of those not currently on ART are not yet diagnosed. As such, scaling up testing and linkage to ART care is central; in settings where this has been done, HIV diagnosis rates are now starting to decrease (Brown et al., 2017). The not yet infected persons have several options to protect themselves from infection. These include use of condoms, although multiple cultural, social and personal factors reduce their public health impact. A new concept is use of pre-exposure prophylaxis (PrEP) by use of one or two of the medicines used as part of ART. WHO in 2015 recommended broad use of this strategy (WHO, 2017). If used consistently (daily use is required to protect women from vaginal exposure and trice weekly for persons practising anal sex), this reduces risk by 70–90%. Finally, uninfected men can be circumcised — as this reduces their risk of infection by sex by approximately 50%. Given the invasive nature of this intervention, it is likely only reasonable to recommend in high prevalence countries.

WHO and UNAIDS have a shared vision of controlling HIV transmission by 2020. This is technically possible and supported by solid evidence. However, it will only happen if there is broad commitment by all relevant stakeholders (primarily policy makers and funders) to ensure unlimited access to HIV testing, ART and PREP. It will be important to continue to monitor progress by use of models exemplified by the report from Awad et al. (2018).

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Jens Lundgren
CHIP, Department of Infectious Diseases, Rigshospitalet, University of Copenhagen, Denmark
E-mail address: jens.lundgren@regionh.dk (J. Lundgren).

Corresponding Editor: Eskild Petersen, Aarhus, Denmark.

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